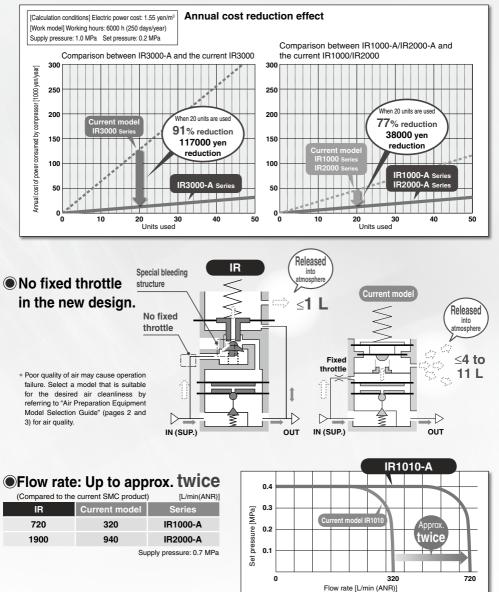


# **Reduction in air consumption**

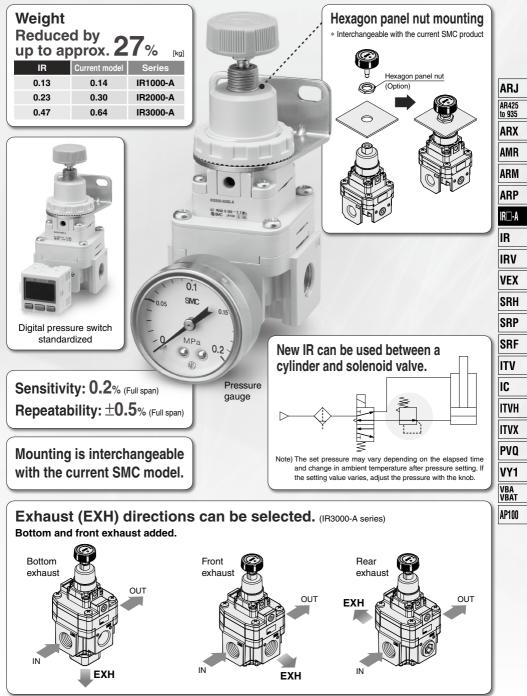
## **•**Air consumption is reduced with a new original structure.

With this new original structure, running costs are reduced.



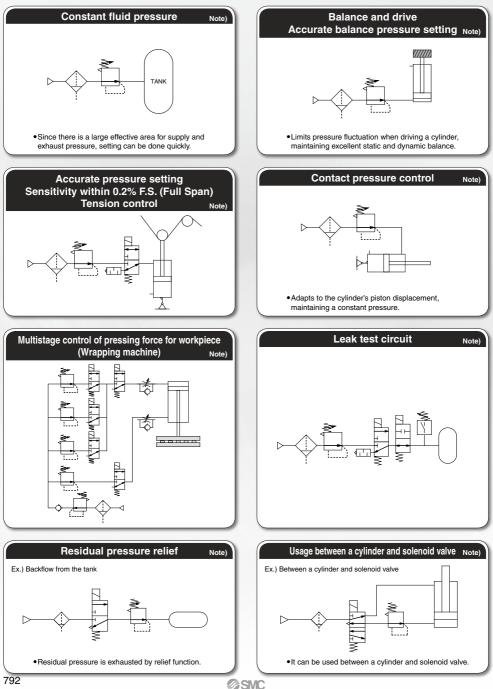
Supply pressure: 0.7 MPa

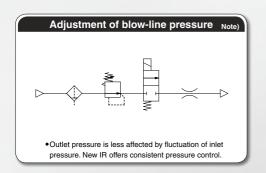
SMC



**SMC** 

## Application Examples





Note) The set pressure may vary depending on the elapsed time and change in ambient temperature after pressure setting. If the setting value varies, adjust the pressure with the knob.

## Series Variations

036	siles variati	0115				VEX
	Se	eries	Model	Set pressure range (MPa)	Port size	SRH
	IR1000-A	<b>?</b>	IR1000-A	0.005 to 0.2		SRP
		a o co	IR1010-A	0.01 to 0.4	1/8	SRF
(qc		Loil	IR1020-A	0.01 to 0.8		ITV
(Knob)	IR2000-A		IR2000-A	0.005 to 0.2		
Type		C Win C	IR2010-A	0.01 to 0.4	1/4	ITVH ITVX
Basic Type			IR2020-A	0.01 to 0.8		PVQ
	IR3000-A	• • •	IR3000-A	0.01 to 0.2		VY1
		n	IR3010-A	0.01 to 0.4	1/4, 3/8, 1/2	VBA VBAT
			IR3020-A	0.01 to 0.8		AP100

ARJ AR425 to 935 ARX AMR

ARM ARP

IR⊡-A

IR IRV



## Standard Specifications

Model		Basic type (Knob)	
Model	IR10□0-A	IR20□0-A	IR30□0-A
Fluid		Air	
Proof pressure		1.5 MPa	
Max. supply pressure		1.0 MPa	
Min. supply pressure Note 1)	Set pressure	e + 0.05 MPa	Set pressure + 0.1 MPa
	IR1000-A: 0.005 to 0.2 MPa	IR2000-A: 0.005 to 0.2 MPa	IR3000-A: 0.01 to 0.2 MPa
Set pressure range	IR1010-A: 0.01 to 0.4 MPa	IR2010-A: 0.01 to 0.4 MPa	IR3010-A: 0.01 to 0.4 MPa
-	IR1020-A: 0.01 to 0.8 MPa	IR2020-A: 0.01 to 0.8 MPa	IR3020-A: 0.01 to 0.8 MPa
Sensitivity		Within 0.2% of full span	
Repeatability Note 2)		Within ±0.5% of full span	
Air consumption Note 3)		1 L/min (ANR) or less	
Port size	1/8	1/4	1/4, 3/8, 1/2
Pressure gauge port		1/8 (2 locations)	
Ambient and fluid temperature Note 4)		-5 to 60°C (No freezing)	
Weight (kg) Note 5)	0.13	0.23	0.47

Note 1) When there is no flow rate on the outlet.

Note 2) Other characteristics such as aging deterioration and temperature characteristics are not included.

Note 3) Measuring conditions: supply pressure 1.0 MPa, set pressure 0.2 MPa

## Accessories (Option)/Part No.

De	scription	IR10□0-A	IR20□0-A	IR30□0-A
Bracket as	sembly Note 1)	IR10P-501AS	IR20P-501AS	IR30P-501AS
Hexagon	panel nut	IR10P-600S	IR20P-600S	IR20P-600S
Round type	0.2 MPa setting	G33-2-□01	G43-2-□01	G43-2-□01
pressure	0.4 MPa setting	G33-4-□01	G43-4-□01	G43-4-□01
gauge Note 2)	0.8 MPa setting	G33-10-□01	G43-10-□01	G43-10-□01
	NPN 1 output	IS	E30A-01-N-N	1L
Digital pressure	PNP 1 output	IS	E30A-01-P-N	1L
switch Note 3)	NPN 1 output/ Voltage output	IS	E30A-01-C-N	1L
	NPN 1 output/ Current output	IS	E30A-01-D-N	۱L

Note 1) This is an assembly of the bracket and resin panel nut.

Note 2) 
in part numbers for a round type pressure gauge indicates a type of connection thread. No indication is necessary for R; however, indicate N for NPT.

A 1.0 MPa pressure gauge is fitted for 0.8 MPa setting. Please contact SMC regarding the supply of pressure gauge with psi unit specifications.

Note 3) 
in part numbers for a digital pressure switch indicates a type of connection thread. No indication is necessary for R; however, indicate N for NPT. For details on handling digital pressure switch and specifications, refer to the Best Pneumatics No. 8. Please contact SMC regarding the supply of digital pressure switch with unit conversion function.

Note 4) -5 to 50°C for the products with the digital pressure switch Note 5) Without accessories

## Modular Products and Accessories

Applicable products		Applicable size	
and accessories	IR1000-A series	IR2000-A series	IR3000-A series
Filter	AF20-A	AF30-A	AF40-A
Spacer	Y200-A	Y300-A	Y400-A
Spacer with bracket	Y200T-A	Y300T-A	Y400T-A

Refer to pages 427 and 430 for details of the modular applicable products and accessories. The former modular and mounting brackets can be used.

		0	00	4567				AI
		ni-standard: Select ni-standard symbo		n tor <b>a</b> to <b>e</b> . Nore than one specification is required, indicate in alphanumeric of	order.			AR4 to 9
/	_					0		]   AF
			Symbol	Description		Body size		
					1	2	3	
			0	0.005 to 0.2 MPa	•		—	AF
	Set n	ressure range	-	0.01 to 0.2 MPa	_	_	•	MI NI
	361 p	lessure range	1	0.01 to 0.4 MPa	•	•	•	AF
			2	0.01 to 0.8 MPa	•			
1			+	Pottom exhaust			•	1 IR
	Evh	aust direction	0	Bottom exhaust Front exhaust	•	•		
	EXII	aust unection	2	Rear exhaust				IR
			+	חשמו שאוומעסו	-		-	· ["
1			Nil	Rc	•	•	•	] IB
	Pipe	e thread type	N	NPT	•	ě	ě	1 🛄
		, unoda type	F	G	•	•	•	V
			+	-	-	-	-	
			01	1/8	•	-	-	S
		Port size	02	1/4	_	•	•	
		Port size	03	3/8	_	—	•	S
			04	1/2	_	—	•	] [0
	ı —		+					S
			Nil	Without mounting option	•	•	•	0
	а	Mounting	B Note 2)	With bracket	•	•	•	IT
÷			н	With hexagon panel nut (for panel mount)	•			
Option Note 1)			+ Nil	Miller de la companya	•		•	1 <b>IC</b>
ĥ		Pressure gauge	G	Without pressure gauge	•	•	•	
ptic			EA	Round type pressure gauge NPN open collector 1 output				П
0	b	With digital	EB	PNP open collector 1 output				1 🙂
		pressure switch	EC	NPN open collector 1 output + Analog voltage output	ě			IT I
			ED	NPN open collector 1 output + Analog current output	•	•	•	1 🙂
			+		-			ן אין
		<b>-</b>	Nil	Flow direction: Left to right		•	•	ונ
	С	Flow direction	R	Flow direction: Right to left	•	•	•	] [V
ard			+			•		v
ndå	d	Knob	Nil	Upward	•	•	•	VE
sta	u	KIIOD	V	Downward	•	•	•	VE
Semi-standard			+					1 AP
s			Nil	Name plate and pressure gauge in imperial units: MPa	•	•	•	
	е	Pressure unit Note 3)	Z	Name plate and pressure gauge in imperial units: psi	•	•	•	4
1	11		ZA	Digital pressure switch: With unit conversion function	•	•		1

Note 1) Options are shipped together with the product, but not assembled. B and H cannot be selected at the same time. The current bracket cannot b used for this product.
Note 2) Assembly of a bracket and set nuts.

Note 3) See pressure unit table below.

	Pipe thread	Name plate	Pressure gauge	in imperial units		1
	type	in imperial units	G	EA, EB, EC, ED	Sales Note 6)	
	Rc				Japan,	1
Nil	NPT	MPa	MPa	Fixed SI unit	Overseas	
	G				Overseas	1
	Rc	—	-	—		
Z Note 4)	NPT	psi	psi	With unit conversion function (Initial value psi)	Only overseas	
	G	—	—	—		
	Rc			With unit conversion		]
ZA Note 5)	NPT	MPa	-	function	Only overseas	li
	G			Iuncuon		

Note 4) For pipe thread type: NPT Note 5) For options: EA, EB, EC, ED Note 6) According to the new Measurement La

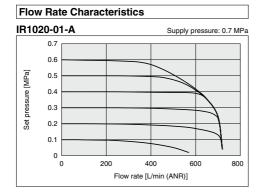
Note 6) According to the new Measurement Law, only the SI unit type is provided for use in Japan.

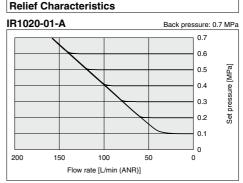


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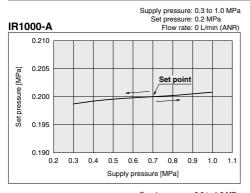
### IR1000-A Series

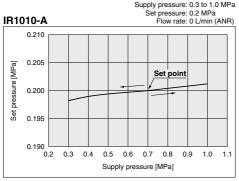
\* The data shown below are representative values, and are not guaranteed.

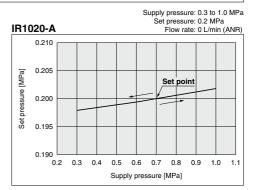




### **Pressure Characteristics**

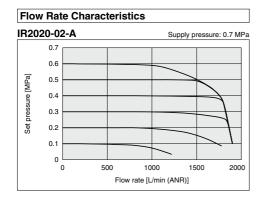




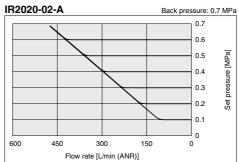


### IR2000-A Series

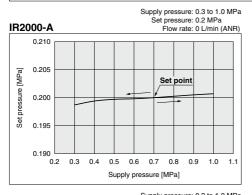
\* The data shown below are representative values, and are not guaranteed.

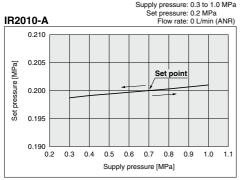


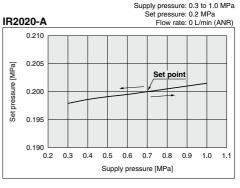
Relief Characteristics



### **Pressure Characteristics**



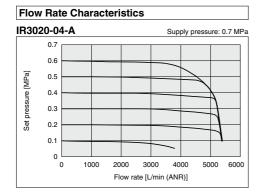




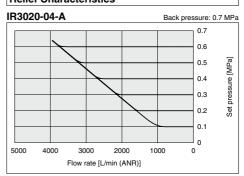
ARJ AR425 to 935 ARX AMR ARM ARP IR 🗆 - A IR IRV VEX SRH SRP SRF ITV IC ITVH ITVX PVQ VY1 VBA VBAT AP100

### IR3000-A Series

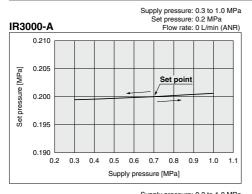
\* The data shown below are representative values, and are not guaranteed.

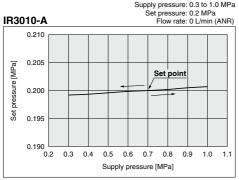


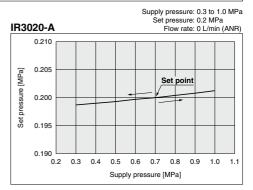
Relief Characteristics



#### **Pressure Characteristics**





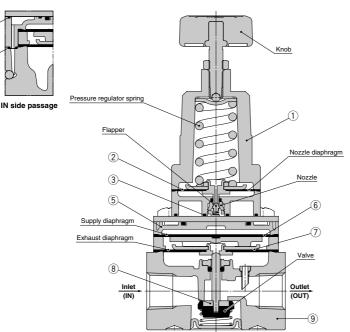


### Construction

4

(4)

### Basic type (Knob): IR20□0-A





OUT side passage

## AMR ARM ARP IR 🗆 - A IR IRV VEX SRH SRP SRF ITV IC ITVH ITVX PVQ VY1 VBA VBAT AP100

ARJ

AR425 to 935

#### Working principle

When the knob is rotated, the flapper is pushed through the spring, and a gap is generated between the nozzle and flapper. The supply pressure flows to the inlet passes through the path between the nozzle and flapper and acts on the supply diaphragm as nozzle back pressure. The force generated by the diaphragm pushes down the valve, and the supply pressure flows to the outlet. The discharged air pressure acts on the exhaust diaphragm, and counteracts against the force generated by the supply diaphragm. The air pressure acts on the nozzle diaphragm at the same time, and counteracts against the compression force of the spring to adjust the set pressure. When the set pressure increases too much, the nozzle diaphragm is pushed up, and a gap is generated between the flapper and nozzle diaphragm after the flapper is closed. The balance of the supply diaphragm and exhaust diaphragm is lost when the nozzle back pressure flows into the atmosphere. The exhaust valve is open after the valve is closed, and excess pressure on the outlet is released to the air. Due to this pilot mechanism, fine pressure variations are detected and precise pressure adjustment is possible.

#### **Component Parts**

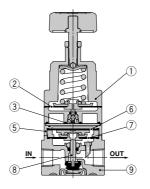
No.	Description		Material	
INO.	Description	IR1000-A	IR2000-A	IR3000-A
1	Bonnet		Aluminum die-casted	
2	Nozzle diaphragm assembly		Aluminum, Weather resistant NBR	
3	Seal		HNBR	
4	Seal		NBR	
5	Diaphragm spacer		Polyacetal	
6	Supply diaphragm	Weather re:	sistant NBR	-
7	Exhaust diaphragm assembly	Steel, Aluminum, We	eather resistant NBR	Aluminum, Weather resistant NBR, HNBR
8	Valve assembly	Stainless steel, A	Aluminum, HNBR	Aluminum, HNBR
9	Body		Aluminum die-casted	

### Construction

### Basic type (Knob): IR10□0-A



IN side passage



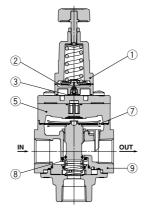


OUT side passage

### Basic type (Knob): IR30□0-A



IN side passage

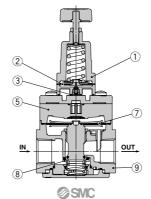




OUT side passage

## Basic type (Knob): IR30□<sup>1</sup><sub>2</sub>-A



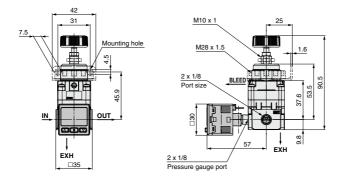




OUT side passage

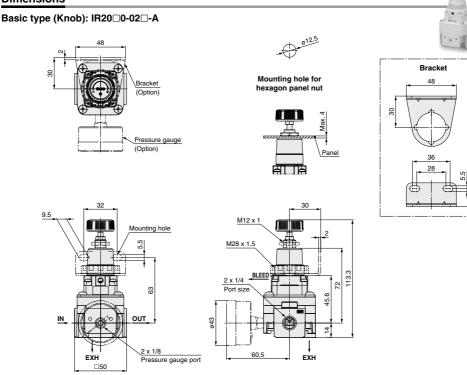
#### Dimensions Basic type (Knob): IR1000-010-A e los .... 42 ø ARJ Bracket AR425 to 935 Mounting hole for 42 32 hexagon panel nut Bracket (Option) ARX ß Max. 4 Pressure gauge (Option) 34 Pane 28 4.5 M10 x 1 31 25 7.5 Mounting hole M28 x 1.5 1.6 4.5 BLEED 2 x 1/8 90.5 53.5 Port size 5.9 37.6 IN OUT 030 8.6 2 x 1/8 43.5 EXH EXH Pressure gauge port □35 When connecting to the EXH port, contact your SMC sales representative separately.

### With digital pressure switch: IR1000-010E-A



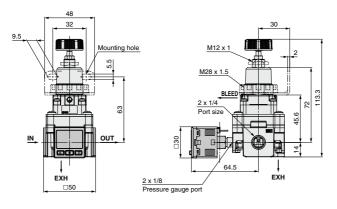


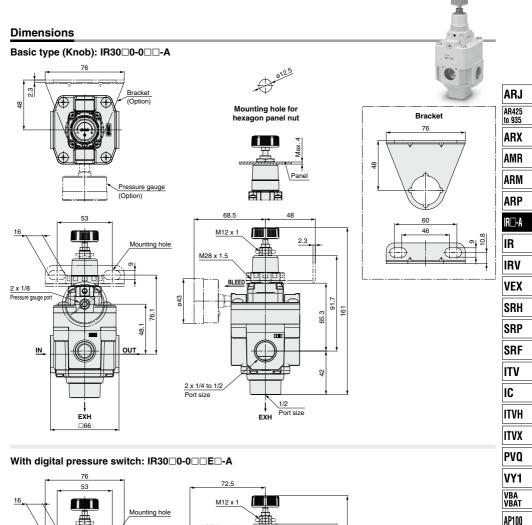
### Dimensions

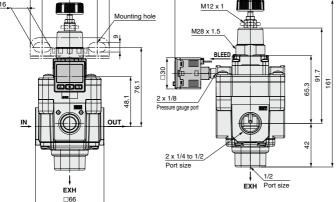


When connecting to the EXH port, contact your SMC sales representative separately.

### With digital pressure switch: IR20 0-02 E -A

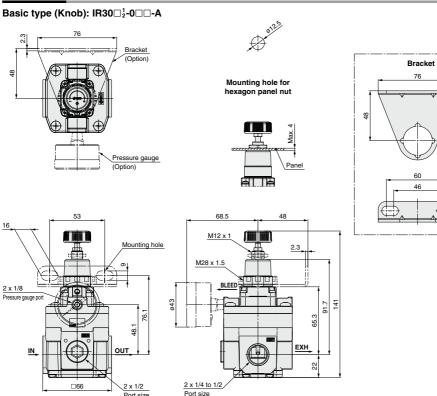






**SMC** 

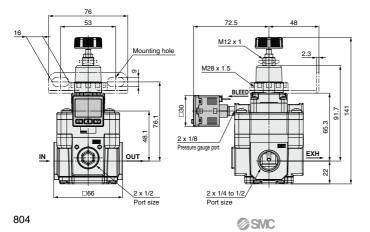
### Dimensions



10.0 σI

### With digital pressure switch: IR30 -2-0 - E -A

Port size





## IR1000-A/2000-A/3000-A Series Specific Product Precautions 1

Be sure to read this before handling the products.

[N·m]

Refer to back page 50 for Safety Instructions and pages 387 to 391 for F.R.L. Precautions.

Piping

## **M**Warning

1. Screw piping together with the recommended proper torque while holding the side with the female threads.

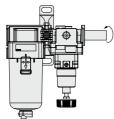
Looseness or faulty sealing will occur if tightening torque is insufficient, while thread damage will result if the torque is excessive.

Furthermore, if the side with the female threads is not held while tightening, excessive force will be applied directly to piping brackets, etc., causing damage or other problems.

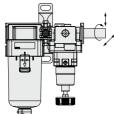
#### Recommended Proper Torque

				[]
Connection thread	1/8	1/4	3/8	1/2 Note)
Torque	7 to 9	12 to 14	22 to 24	28 to 30

Note) Tightening force for connecting to the EXH port of  $IR30\square_2^1$ -A is 8 to 10 N·m.



2. Do not allow twisting or bending moment to be applied other than the weight of the equipment. Provide separate support for external piping, as damage may otherwise occur.

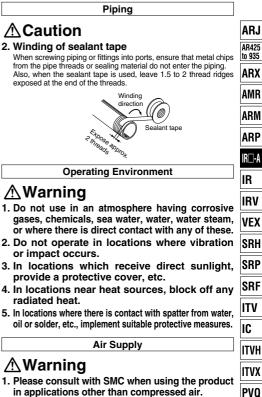


 Piping materials without flexibility such as steel tube piping are prone to be effected by excess moment load and vibration from the piping side. Use flexible tubing in between to avoid such an effect.

## **▲**Caution

#### 1. Preparation before piping

Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil and other debris from inside the pipe.



- Do not use compressed air which includes chemicals, synthetic oils containing organic solvents, salt or corrosive gases, etc., as this can cause damage or malfunction.
- 3. If condensate in the drain bowl is not emptied on a regular basis, the bowl will overflow and allow the condensate to enter the outlet side. This will cause a malfunction of pneumatic equipment.

When removing drain is difficult, use of a filter with an auto drain is recommended.

## ▲Caution

- Condensate or dust, etc. in the supply pressure line can cause malfunctions. In addition to an air filter (SMC AF series, etc.), please use a mist separator (SMC AM, AFM series) depending on the conditions. Refer to "Air Preparation Equipment Model Selection Guide" (pages 2 and 3) for air quality.
- 2. When a lubricator is used at the supply side of the product, it can cause malfunctions. Do not use a lubricator at the supply side of the product. If lubrication is required for terminal devices, connect a lubricator on the output side of the regulator.

VY1

VBA

VBAT

AP100



## IR1000-A/2000-A/3000-A Series Specific Product Precautions 2

Be sure to read this before handling the products.

Refer to back page 50 for Safety Instructions and pages 387 to 391 for F.R.L. Precautions.

Maintenance

## **M**Warning

- 1. When the product is removed for maintenance, reduce the set pressure to "0" and shut off the supply pressure completely beforehand.
- 2. When a pressure gauge is to be mounted, remove the plug after reducing the set pressure to "0".
- 3. When using the regulator between a solenoid valve and an actuator, check the pressure gauge periodically. Sudden pressure fluctuations may shorten the durability of the pressure gauge.

A digital pressure gauge is recommended for such situation or as deemed necessary.

#### Handling

## **≜**Caution

1. When the precision regulator with pressure gauge is used, do not apply impact to the product by dropping it, etc. during transportation or installation.

This may cause misalignment of the pressure gauge pointer.

### Operation

## **▲**Caution

- 1. Do not use a precision regulator outside the range of its specifications as this can cause failure. (Refer to the specifications.)
- 2. When mounting is performed, make connections while confirming port indications.
- 3. When mounting the bracket or tightening the hexagon panel nut on the panel, tighten them to the recommended proper torque.

Looseness or faulty sealing will occur if tightening torque is insufficient, while thread damage will result if the torque is excessive.

Recommended Proper Torque (N·m)	
Set nut (for bracket)	

	,	
IR10□0-A	IR20□0-A	IR30□□-A
	2.0±0.2	
Hexagon panel nu	ıt (for knob type o	nly)
Hexagon panel nu IR10□0-A	ut (for knob type o IR20□0-A	nly) <b>IR30□□-A</b>

4. After pressure adjustment, be sure to tighten the lock nut. When tightening the nut, tighten so that the knob does not move due to friction caused by tightening. Operation

## **≜**Caution

- 5. When pressure is applied to the inlet of a regulator, make sure that the output is connected to the circuit. Air blow occurs from the outlet and it depends on the operating conditions.
- 6. The set pressure may vary depending on the elapsed time and change in ambient temperature after pressure setting. If the setting value varies, adjust with the knob.
- 7. If the directional control valve (solenoid valve, mechanical valve, etc.) is mounted and ON-OFF is repeated for a long time, the set pressure may vary. If the setting value varies, adjust with the knob.
- 8. There may be pulsation or noise depending on the pressure conditions, piping conditions and ambient environment. In this case, it is possible to improve the problem by changing the pressure conditions and piping conditions.

If the problem is not improved, contact your SMC sales representative.

- 9. The capacity of the output side is large, and when used for the purpose of a relief function, the exhaust sound will be loud when being relieved. Therefore, operate with a silencer (SMC AN series, etc.) mounted on the exhaust port (EXH port). When using the IR100-A and 2000-A series, contact your SMC sales representative.
- 10. When installing a pressure gauge to the product, do not apply pressure more than the maximum display pressure. This will cause a malfunction.